Financing Energy Markets
(Mondays: 4:00-7:15 / Uris 330 / January 26th – April 29th)

Professor Brooks Klimley                       Spring 2016
B8352-001

Note: First session will be held on Friday 1/29/2016 which replaces Monday 3/7/2016

Summary Course Description & Syllabus

Course Description: The global energy industry is comprised of the largest and most interrelated set of businesses in the world. From its inception, the industry has grown dramatically to provide ever increasing amounts of energy and power to commercial, industrial and retail consumers around the world. Given its unique industry structure, specialized financing techniques have been developed to expand and/or complement conventional public and private financing alternatives. These specialized financing approaches have, in turn, allowed the energy industry to access an unprecedented range of capital sources to fund its increasingly complex operating and financing needs.

Course Objectives: This course is designed to familiarize students with the terms and applications of various financing structures developed for the energy industry in response to ever evolving industry, regulatory and market conditions. While the energy business is quintessentially global in nature, the course will focus largely on public and private financings within domestic (U.S.) markets given their greater maturation. Following an initial review of the various components of the global energy chain, the class will focus on a series of modules covering conventional and clean energy markets and related asset-based, project, commodity-linked and tax-driven financing alternatives. Specific attention will be given to the identification of various risks contained in each of these financings and the relevant physical, contractual and financial mechanisms which have been designed to dimension and allocate them among relevant parties.

Textbooks and Materials: In order to effectively cover both the industry and financial content contemplated in each week’s topic, students will be shown selected passages from general financing texts and certain industry periodicals. These readings will be supplemented by industry articles and materials available at various industry associations to allow students to gain a working knowledge of specific industry sub-sectors and their related financings. While not designed to be technical in nature, the course will require students to be familiar with reading assignments, which will include some technical material Specific company and/or project information from public and private sources will be incorporated into the case assignments. The completion of the cases will require students to have a working knowledge of the Microsoft Office suite of products, and students should expect to spend 3-4 hours preparing for class each week. In addition, students should have a working knowledge of corporate finance and to a lesser extent accounting in order to analyze and implement the subject financing structures.

Methods of Evaluation: In order to facilitate discussion, student participation is encouraged and attendance will be taken. Weekly quizzes will be administered and class participation will be very important. In addition to weekly contributions to discussions covering energy financing markets, students, working in groups, will complete: (i) three cases during the course of the term and (ii) a Master Case at the end of the term which will require them to formulate an appropriate financing plan for a pre-determined set of energy and power assets. The various groups will submit the Master Case at the end of the semester. Grades will be determined by the quality of class participation (33%), casework submissions (33%) and the Master Case (33%).

Note: It is important that all students attend the first class session (See note above on timing for 2016)

Office Hours: By appointment

Summary Course Description and Reading List

(Reading materials will be updated through the term and will be downloaded on Canvas whenever possible)

Section 1  Introduction and Overview:


Reference:  The Global Oil & Gas Industry: Management, Strategy & Finance
By Andrew Inkpen/Michael H. Moffett 2011
Chapter 1: The Global Oil and Gas Industry

BP Statistical Review of World Energy (June 2015)

U.S. Energy Information Administration

Short Term Energy Outlook (2015)
U.S. Energy Information Administration

Annual Energy Outlook 2015 (Projections to 2040)
U.S. Energy Information Administration

U.S. Energy Information Administration

Glossary of Terms
U.S. Energy Information Administration

“There Will Be Oil”
By Jason Bordoff, Director
The Center on Global Energy Policy (Columbia University)
Summer 2013

Section 2  Asset Based Finance: Oil and Gas Exploration and Production

Lecture:  “Bootstrap Finance: Oil and Gas Exploration and Production”

Reference:  The Global Oil & Gas Industry: Management, Strategy & Finance
By Andrew Inkpen/Michael H. Moffett 2011
Chapter 3,5 and 8:  pages 82-102; 170-176; 190-198; 302-332
Casework: Blue Lion Oil & Gas (to be distributed)

Section 3  Project Finance I: Domestic Power Construction/Development

Lecture: “To Be or Not to Be: Whether it is Nobler to Contract or Go Merchant”

By Roy L. Nersesian
Chapter 2: Electricity and the Utility Industry

By E.R. Yescombe
Overview: Chapter 2
Contractual: Chapter 6, 7, 8, 9

“Merchant Power: A Discussion of Merchant Power Market Dynamics”
Morgan Stanley Equity Research (February 23, 2011)

Calpine Corporation: The Evolution from Project to Corporate Finance
(HBS: 9-210-098 January 21, 2003)

“Project Finance Glossary”
(HBS 9-203-040 July 21, 2006)

Section 4  Policy Finance II: Conventional Fuels - Coal

Lecture: “King Coal and the Regulator Man”

By Roy L. Nersesian
Chapter 4: Coal

By E.R. Yescombe
Financial: Chapters 12 and 13

Profiting from Clean Energy (Wiley 2008)
By Richard W. Asplund Chapters 2, 4, 16

“Recommended Project Finance Structures for the Economic Analysis of Fossil-Based Energy Projects”
National Energy Technology Laboratory (September 8, 2008)

Casework: Longview Power, LLC (to be distributed)

Section 5  Project Finance III: International Liquefied Natural Gas (“LNG”)

Lecture:  “Late Not Great: Liquefied Natural Gas and the International Gas Market”

Reference: The Global Oil & Gas Industry: Management, Strategy & Finance
By Andrew Inkpen/Michael H. Moffett 2011
Chapter 9: Liquefied Natural Gas (LNG) pages: 334-360

By E.R. Yescombe
Political Risk: Chapters 10, 11

By Roy L. Nersesian
LPG/LNG: pages: 251-270

“Oil and Gas for Beginners: A Guide to the Oil and Gas Industry”
Pages 215-235

“Liquid Markets: Assessing the Case for US Exports of Liquefied Natural Gas”

Section 6  Policy Finance I: Alternative Energy - Biofuels

Lecture:  Ethanol and the Long Hand of the Law”

By Roy L. Nersesian
Biofuels: pages: 53-91

By: Betty Simkins, Russell Simkins, and Editors
Kolb Series in Finance
Chapters: 14

Profiting from Clean Energy (Wiley 2008)
By Richard W. Asplund Chapters 14-15

“Fundamentals of a Sustainable U.S. Biofuels Policy”
Section 7 Policy Finance II: Tax Driven Finance: Master Limited Partnerships


Reference:
- “Wells Fargo Primer: Everything You Wanted to Know About MLPs but Were Afraid to Ask” 5th Edition”
  Wells Fargo Securities, LLC Equity Research
  October 31, 2013
c/o National Association of Publicly-Traded Partnerships

- “CS MLP Primer – Part Deux”
  Credit Suisse Equity Research (November 23, 2011)
c/o National Association of Publicly-Traded Partnerships

- “Midstream Energy MLPs: Primer 3.0”
  Morgan Stanley Research
  April 17, 2013

Casework: Regency Energy Partners, LP (to be distributed)

Section 8 Policy Finance III: Renewable Energy - Wind

Lecture: “Great Folk Myths: Blowing in the Wind and Tax Flip Structures”

Reference:
  By Roy L. Nersesian
  Wind: pages: 309-323

- “Wind Project Financing Structures”
  Lawrence Berkeley National Laboratory
  By John Harper, Matt Karcher and Mark Bolinger
  September 2007

- “PTC, ITC or Cash Grant? An Analysis of the Choice Facing Renewable Power Projects in the United States”
  Lawrence Berkeley National Laboratory
  By Mark Bolinger and Ryan Wiser March 2009

- “Revealing the Hidden Value that the Federal Income Tax Credit and Treasury Cash Grant Provide to Community Wind Projects”
  Lawrence Berkeley National Laboratory
  By Mark Bolinger
  January 2010
Section 9  **Policy Finance IV: Renewable Energy – Solar**

Lecture:  “Here Comes the Sun: Residential Lease Securitization”

Reference: To come

Section 10  **Commodity Finance: Precious Metals and Energy Derivatives**

Lecture: “Capturing Optionality: Commodity Finance and Structured Financing Alternatives”

Reference:  
By: Betty Simkins, Russell Simkins, and Editors  
Kolb Series in Finance Wiley Press 2013  
Chapters 4: Sustainable Energy: Myths and Realities  
Profiting from Clean Energy (Wiley 2008) 
By Richard W. Asplund Chapters 6

Structured Products Vol. 2: Equity; Commodity Credit & New Markets By: Satyajit Das  
(Commodity-Linked Structures – pages 447-649)

American Barrick Resources Corporation: Managing Gold Price Risk  
(HBS 9-293-128 October 6, 1995)

Section 11  **The Master Case: Columbia Energy Holdings, Inc.**

The class will be split into teams which will receive a template for a Financing Memorandum issued by Columbia University Energy Holdings, Inc. (“CEH”), a wholly-owned subsidiary of Columbia University in the City of New York (“Columbia”). CEH owns or controls a variety of energy and power assets, which have been either developed by or contributed to Columbia. The teams will be asked to complete the Financing Memorandum by designing and articulating the optimal financing(s) for the issuer consistent with the operating and financial parameters set forth by the Board of Trustees and the University’s financial staff.
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Supplementary References and Reading List

General:
The Global Oil & Gas Industry: Management, Strategy & Finance
By: Andrew Inkpen and Michael H. Moffett
Penwell 2011

By: Betty Simkins, Russell Simkins, and Editors
Kolb Series in Finance

Resource Revolution: Tracking global commodity markets
Trends Survey 2013
McKinsey Global Institute
McKinsey Sustainability & Resource Productivity Practice

Oil & Gas:
“The Shale Revolution”
Credit Suisse Securities Research and Analytics
13 December 2012

“Shale Gas and U.S. National Security”
Kenneth B. Medlock III, Amy Myers Jaffe and Peter R. Hartley
Energy Forum at the James A. Baker Institute for Public Policy at Rice University
July 2011

“Shale Gas: New Opportunities, New Challenges”
Bi-Partisan Policy Center Energy Project
January 2012

The Shale Oil and Gas Revolution, Hydraulic Fracturing, and Water Contamination: A Regulatory Strategy
By Thomas W. Merrill & David M. Schizer
Columbia University Law School March 2013

“The Understanding Drilling Technology”
Paleontological Research Institute at the Museum of Earth
Marcellus Shale Issue Number 6
January 2012

Quarterly Lender Price Survey
Macquarie Tristone Research

Renewables:
“Beyond Boom and Bust: Putting Clean Tech on a Path to Subsidy Independence”
Breakthrough Institute (April 2012)